

CLAIMS

What is claimed is:

1. A method of operating a wireless network of nodes, said nodes including receiver nodes and a user node, said method comprising:

for each of said nodes, defining a narrowband channel for extra-network communication;

establishing a wideband backbone for intra-network communication between said nodes;

engaging in communication over said narrowband channel at said receiver nodes to carry a signal between said receiver nodes and an extra-network location; and

communicating said signal as distinct bitstreams between said receiver nodes and said user node using said wideband backbone.

2. A method as claimed in claim 1 further comprising utilizing an ultra wideband technology to establish said wideband backbone.

3. A method as claimed in claim 1 wherein said method further comprises selecting a radio frequency (RF) capability that defines said narrowband channel, said selecting operation choosing said RF capability from a group of disparate RF capabilities.

4. A method as claimed in claim 3 wherein said RF capability is a first RF capability, and said selecting operation chooses, for said user node, a second RF capability from said group of disparate RF capabilities, said second RF capability defining a second narrowband channel for communication between said user node and a second source outside of said network.

5. A method as claimed in claim 1 wherein:
said engaging operation comprises receiving said signal at said receiver nodes;
said communicating operation comprises forwarding said signal as said distinct bitstreams from said receiver nodes to said user node; and
said method further comprises:
determining, at said user node, a preferred bitstream of said signal from said distinct bitstreams; and
presenting said preferred bitstream to a destination.

6. A method as claimed in claim 5 further comprising instructing said receiver nodes to monitor for said signal over said narrowband channel.

7. A method as claimed in claim 5 further comprising:
establishing, prior to said forwarding operation, communication paths between each of said receiver nodes and said destination; and
defining said user node to be a closest common node to each of said receiver nodes along said communication paths.

8. A method as claimed in claim 5 further comprising demodulating said signal at said receiver nodes prior to said forwarding operation.

9. A method as claimed in claim 5 wherein said determining operation comprises:

- temporally aligning said distinct bitstreams;
- evaluating a signal quality criterion of each of said distinct bitstreams; and
- selecting one of said distinct bitstreams in response to said evaluating operation as said preferred bitstream.

10. A method as claimed in claim 5 wherein said determining operation comprises:

- temporally aligning said distinct bitstreams; and
- ascertaining said preferred bitstream by a majority vote.

11. A method as claimed in claim 10 further comprising regulating a quantity of said receiver nodes used for said majority vote to be an odd number.

12. A method as claimed in claim 5 wherein said determining operation further comprises:

- temporally aligning said distinct bitstreams;
- weighting said distinct bitstreams according to a signal quality criterion of each of said distinct bitstreams; and
- selectively combining said bitstreams in response to said weighting operation to determine said preferred bitstream.

13. A method as claimed in claim 12 wherein said method further comprises:

demodulating said signal at said receiver nodes; and
quantizing said signal at each of said receiver nodes to obtain each of said distinct bitstreams, said demodulating and quantizing occurring prior to said forwarding operation.

14. A method as claimed in claim 12 wherein:

said forwarding operation forwards information spectrums of said signal as said distinct bitstreams; and

said determining operation further comprises demodulating said preferred bitstream.

15. A method as claimed in claim 14 wherein said determining operation further comprises distinguishing said signal from an interference signal within each of said distinct bitstreams prior to said weighting operation.

16. A method as claimed in claim 1 wherein:

said communicating operation comprises receiving said bitstreams at said receiver nodes from said user node over said wideband backbone; and

said engaging operation comprises transmitting said distinct bitstreams as said signal from each of said receiver nodes toward said extra-network location.

17. A method as claimed in claim 16 wherein:

said method further comprises determining, for said each of said receiver nodes, a time shift parameter and a frequency shift parameter relative to said extra-network location; and

said transmitting operation comprises adjusting, at said each of said receiver nodes, a transmit time and a transmit frequency of said signal in response to said time shift parameter and said frequency shift parameter to facilitate constructive combining of said signal from said each of said receiver nodes at said extra-network location.

18. A method of operating a wireless network of nodes comprising:

selecting a first RF capability for a first one of said nodes that defines a first narrowband channel for extra-network communication;

selecting a second RF capability for a second one of said nodes that defines a second narrowband channel for said extra-network communication;

establishing a wideband backbone for intra-network communication between said nodes;

engaging in communication over said second narrowband channel at said second node to carry a signal between said second node and an extra-network location; and

communicating said signal as a bitstream between said first and second nodes using said wideband backbone.

19. A method as claimed in claim 18 further comprising utilizing an ultra wideband technology to establish said wideband backbone.

20. A method as claimed in claim 18 wherein said first and second RF capabilities are chosen from a group of disparate RF capabilities, and said method further comprises:

receiving, at each of said nodes, configuration information for a chosen RF capability from said group of disparate RF capabilities; and

implementing, at said each node, said configuration information to enable said extra-network communication utilizing a narrowband channel defined by said chosen RF capability.

21. A method as claimed in claim 18 further comprising: engaging in communication over said first narrowband channel at said first node to carry a second signal between said first node and a second extra-network location; and

communicating said second signal as a second bitstream between said first and second nodes using said wideband backbone.

22. A method as claimed in claim 18 further comprising selecting, for a third one of said nodes, said second RF capability defining said second narrowband channel for said extra-network communication.

23. A method as claimed in claim 22 wherein said bitstream is a first bitstream, and:

said engaging operation comprises receiving said signal at said second and third nodes;

said communicating operation comprises forwarding said signal as said first bitstream from said second node to said first node, and forwarding said signal as a second bitstream from said third node to said first node; and

said method further comprises:

determining, at said first node, a preferred bitstream of said signal from said first and second bitstreams; and presenting said preferred bitstream to a destination.

24. A method as claimed in claim 23 wherein said determining operation comprises:

temporally aligning said first and second bitstreams;

evaluating a signal quality criterion of each of said first and second bitstreams; and

selecting one of said first and second bitstreams in response to said evaluating operation as said preferred bitstream.

25. A method as claimed in claim 24 wherein further comprising demodulating said signal at said second and third nodes prior to forwarding said first and second bitstreams.

26. A method as claimed in claim 23 wherein:

said method further comprises, selecting, for a fourth one of said nodes, said second RF capability defining said second narrowband channel for said extra-network communication;

receiving said signal at said fourth node over said second narrowband channel;

forwarding said signal as a fourth bitstream from said fourth node to said first node over said wideband backbone; and said determining operation comprises:

temporally aligning said first, second, and third bitstreams; and

ascertaining said preferred bitstream by a majority vote.

27. A method as claimed in claim 26 wherein further comprising demodulating said signal at said second and third nodes prior to forwarding said first and second bitstreams.

28. A method as claimed in claim 23 wherein said determining operation comprises:

temporally aligning said first and second bitstreams at said first node;

weighting said first and second bitstreams according to a signal quality criterion of each of said first and second bitstreams; and

selectively combining said first and second bitstreams in response to said weighting operation to determine said preferred bitstream.

29. A method as claimed in claim 28 further comprising:
demodulating said signal at said second and third nodes
prior; and

quantizing said signal at each of said second and third
nodes to obtain said first and second bitstreams prior to said
forwarding operation.

30. A method as claimed in claim 23 wherein:

said forwarding operation forwards information spectrums of
said signal as said first and second bitstreams; and

said determining operation comprises:

temporally aligning said first and second bitstreams;

weighting said first and second bitstreams according to a
signal quality criterion of each of said first and
second bitstreams;

selectively combining said first and second bitstreams in
response to said weighting operation to determine said
preferred bitstream; and

demodulating said preferred bitstream.

31. A method as claimed in claim 30 wherein said
determining operation further comprises distinguishing said
signal from an interference signal within each of said first
and second bitstreams prior to said weighting operation.

32. A method as claimed in claim 18 wherein:

said communicating operation comprises receiving said bitstream at said second node from said first node over said wideband backbone; and

said engaging operation comprises transmitting said distinct bitstream as said signal from said second node toward said extra-network location.

33. A method as claimed in claim 32 wherein said bitstream is a first bitstream, and said method further comprises:

selecting, for a third one of said nodes, said second RF capability defining said second narrowband channel for said extra-network communication;

receiving a second bitstream of said signal at said third node from said first node over said wideband backbone;

determining, for each of said second and third nodes, a time shift parameter and a frequency shift parameter relative to said extra-network location; and

adjusting, at each of said second and third nodes prior to said transmitting operation, a transmit time and a transmit frequency of said signal in response to said time shift parameter and said frequency shift parameter to facilitate constructive combining of said signal from said each of said second and third nodes at said extra-network location.

34. A definable radio for use in a wireless network, said radio comprising:

a first software programmable transceiver configured for extra-network communication using a narrowband channel defined by a radio frequency (RF) capability, said RF capability being chosen from a group of disparate RF capabilities;

a second transceiver configured for intra-network communication over a wideband backbone;

a control processing section in communication with said first and second transceivers, said control processing section enabling said first software programmable transceiver to engage in communication over said narrowband channel to carry a signal between said radio and an extra-network location, and said control processing section enabling forwarding of said signal as a distinct bitstream over said wideband backbone between said second transceiver and a second definable radio.

35. A definable radio as claimed in claim 34 wherein said control processing section extracts said signal from an information spectrum received at said first transceiver over said narrowband channel, and converts said signal to said distinct bitstream for forwarding over said wideband backbone.

36. A definable radio as claimed in claim 35 wherein said control processing section quantizes said distinct bitstream prior to forwarding said distinct bitstream over said wideband backbone.

37. A definable radio as claimed in claim 35 wherein said control processing section selectively converts an information spectrum received at said first transceiver over said narrowband channel to said distinct bitstream prior to forwarding said distinct bitstream over said wideband backbone.

38. A definable radio as claimed in claim 34 wherein when said second transceiver receives multiple distinct bitstreams of said signal from other definable radios, and said control processing section determines a preferred bitstream of said signal from said multiple distinct bitstreams and presents said preferred bitstream to a destination.

39. A definable radio as claimed in claim 38 wherein said control processing section temporally aligns said multiple distinct bitstreams, evaluates a signal quality criterion of each of said multiple distinct bitstreams, and selects one of said multiple distinct bitstreams in response to said evaluating operation as said preferred bitstream.

40. A definable radio as claimed in claim 38 wherein said control processing section temporally aligns said multiple distinct bitstreams and ascertains said preferred bitstream by a majority vote.

41. A definable radio as claimed in claim 38 wherein said control processing section temporally aligns said multiple distinct bitstreams, weights said multiple distinct bitstreams, and selectively combines said multiple distinct bitstreams in response to said weighting operation to obtain said preferred bitstream.

42. A definable radio as claimed in claim 34 wherein said control processing section extracts said signal from information spectrums of distinct bitstreams received at said second transceiver over said wideband backbone, determines a preferred bitstream, and demodulates said preferred bitstream, and said second transceiver presents said preferred bitstream to a destination.

43. A definable radio as claimed in claim 42 wherein prior to demodulation, said control processing section temporally aligns said received bitstreams, weights said received bitstreams according to a signal quality criterion of each of said distinct bitstreams, and selectively combines said distinct bitstreams to obtain said preferred bitstream.

44. A definable radio as claimed in claim 43 wherein prior to weighting said received bitstreams, said control processing section distinguishes said signal from an interference signal within each of said distinct bitstreams.

45. A wireless network comprising:

- a first node selectively configured for extra-network communication over a first narrowband channel utilizing a first radio frequency (RF) capability; and

- a second node selectively configured for extra-network communication over a second narrowband channel utilizing a second RF capability, each of said first and second nodes being configured for intra-network communication utilizing a wideband backbone, wherein:

- a first signal received at said first node over said first narrowband channel is forwarded to said second node over said wideband backbone as a first bitstream; and

- a second signal received at said second node over said second narrowband channel is forwarded to said first node over said wideband backbone as a second bitstream.

46. A wireless network as claimed in claim 45 further comprising a third node selectively configured for extra-network communication over said first narrowband channel utilizing said first radio frequency (RF) capability, wherein when said first signal is received at said third node over said first narrowband channel, said third node forwards said first signal to said second node over said wideband backbone as a third bitstream, said second node determines a preferred bitstream from said first and third bitstreams, and said second node presents said preferred bitstream to a destination.